REMARKS

Brief Discussion of the Invention

The invention involves a sample collection substrate of aerogel and/or xerogel materials bound to a support structure which is used as a solid phase microextraction (SPME) device. The xerogels and aerogels may be organic or inorganic and doped with metals or other compounds to target specific chemical analytes. The support structure may comprise a metal wire or glass or plastic fibers. Dipping the fiber or wire in an aerogel or xerogel precursor solution and then drying the material may form a device used for solid phase microextraction wherein the xerogel or aerogel covers the entire perimeter of one end of the fiber or wire.

Claim Amendments

Support for the amendment to claim 1 is found in Applicant's specification, page 5, lines 13-17. Support for new claims 21-23 is found in Applicant's specification, page 5, lines 13-17 and page 6, lines 10-20.

The March 21, 2001 Office Action

Claims 1-3, 5, 6, 9-11, 13-15, 18 and 20 were rejected under 35 U.S.C. § 102 and claims 4, 7, 8, 12, 16, 17 and 19 were rejected under 35 U.S.C. § 103. Applicants cancel claims 13-20 and elect the claims 1-12, drawn to an apparatus, to be examined with this response.

Rejections Under 35 U.S.C. §102(b)

Claims 1, 5, 6, 9, and 11 were rejected under 35 U.S.C. §102(a) as being anticipated by Hair et al (U.S. Patent No. 5,851,947). Applicants respectfully traverse these rejections because Hair et al do not disclose "supported aerogels" as defined in Applicants application, but rather Hair et al disclose aerogels that incorporate noble metals. Claim 1 includes the limitation that the apparatus is "constructed for solid phase microextraction". Applicants have amended claim 1 to claim a "support structure" as a material formed of glass or plastic fibers or a metal wire which is coated with a substrate formed of aerogel, xerogel, or combinations thereof. In column 2, lines 34-48, Hair et al state that the invention involves "the incorporation of noble metals into aerogels and xerogels." Hair et al disclose an aerogel or xerogel that form a support structure for noble metals, whereas Applicants are claiming a glass or plastic fiber or metal wire that forms a support structure for aerogel or xerogel materials. Applicants respectfully submit that the type of "supported aerogel" the examiner cites from Hair et al is not of the type claimed by Applicants. Thus, the rejection under 35 U.S.C. §102(a) should be withdrawn.

Claims 1, 5, 9 and 10 were rejected under 35 U.S.C. §102 (b) as being anticipated by Miles et al (U.S. Patent No. 4,335,017). Applicants respectfully traverse these rejections because Miles et al do not disclose "supported aerogels" as claimed by Applicants, but rather Miles et al disclose a deformable gel retained within the pore structure of a porous rigid support material, wherein the porous rigid support material is in the form of discrete porous particles having an interconnected pore structure (defined in US 3,943,072, i.e., TiO_2, Al_2O_3, calcium phosphate and $BaSO_4$). (See Miles col. 1, lines 11-24 and Thompson col. 3, lines 63-68) Applicants claim a "support structure" as a material formed of glass or plastic fibers or a metal wire which is coated with a substrate formed of aerogel, xerogel, or combinations thereof. Thus, the type of "supported gel material" the examiner cites from Miles et al is not of the type claimed by Applicants. In addition, independent claim 1 includes the limitation that the apparatus is a "solid phase microextraction apparatus". Applicants respectfully submit that the rejection under 35 U.S.C. §102(b) should be withdrawn.

Claims 1 and 3 were rejected under 35 U.S.C. §102(b) as being anticipated by Lev et al (U.S. Patent No. 5, 643,447). Applicants respectfully traverse these rejections because Lev et al do not disclose "supported aerogels" as defined in Applicants' application, but rather Lev et al disclose "[a] planar chromatographic plate comprising a supported homogeneous thin porous film of ceramic material produced by sol-gel technology..." (See Lev et al col. 3, lines 28-30). Column 5, lines 33-35 of Lev et al states, "25 x 75 mm microscope slides were coated with 0.2 ml of fresh solution and dried overnight in ambient conditions." This is representative of the type of "supported gel material" that Lev et al disclose. Applicants define a "support structure" as a material formed of glass or plastic fibers or a metal wire which is coated with a substrate formed of aerogel, xerogel, or combinations thereof. (See Applicants specification page 5, lines 7-14). Independent claim 1 includes the limitation that the apparatus is a "solid phase microextraction apparatus". Claims 1 also includes the limitation that the substrate, i.e., gel material, cover the entire perimeter of one end of the support structure. Coverage of the entire perimeter occurs when "[t]he support structure 20 is placed or suspended in a container 22 with the aerogel precursor solution 24 to coat the end 26 of the structure 20. The coated fiber or wire 28 is then removed from solution and dried." (See Applicant's specification page 9, lines 16-21 and figures 2A and 2B) Applicants respectfully submit that the type of "supported gel material" the examiner cites from Lev et al is not of the type claimed by Applicants. Thus, the rejection under 35 U.S.C. §102(a) should be withdrawn.

Claims 1, 2, 5, 6 and 9 were rejected under 35 U.S.C. §102 (e) as being anticipated by Zare et al (U.S. Patent No. 6,136,187). Applicants respectfully traverse these rejections because Zare et al do not disclose "supported aerogels" as defined in Applicants' application, but rather Zare et al disclose "[a] porous sol-gel glass matrix attached to the inner wall of the separation channel" (See Zare, abstract). Applicants define a "support structure" as a material formed of glass or plastic fibers or a metal wire which is coated with a substrate formed of aerogel, xerogel, or combinations thereof. (See Applicants specification page 5, lines 7-14). Independent claim 1 includes the limitation that the apparatus is a "solid phase microextraction apparatus." Claims 1

includes the limitation that the substrate, i.e., gel material, cover the entire perimeter of one end of the support structure. Zare et al only discloses coverage of "an inner wall" not coverage of the entire perimeter of the separation channel, i.e., the support structure. Applicants respectfully submit that the type of "supported gel material" the examiner cites from Zare et al is not of the type claimed by Applicants. Thus, the rejection under 35 U.S.C. §102(a) should be withdrawn.

Rejections under 35 U.S.C. §103(a)

Claims 4 and 12 were rejected under 35 U.S.C. §103(a) as being unpatentable over Hair et al, Miles et al, Lev et al or Zare et al. Applicants respectfully traverse these rejections because all of the claims rejected are dependant claims, which depend from independent claim 1 and thus contain all of those claim limitations. Claim 1 includes the structural limitation that the apparatus be suitable for solid phase microextraction. Such an application is not suggested in the above-cited references. Parameters cited by the Examiner, such as the exact number of layers employed, the shape of the support, and the technique used to contact the support and coating material can materially affect the overall results of an apparatus used for a solid phase microextraction application. In addition, Claim 1 includes the structural limitation that the substrate, i.e., layer of gel material, coat the entire perimeter of the support structure. Such structural limitations are not suggested in the above-cited references. Applicants respectfully submit that the rejections under 35 U.S.C. §103(a) should be withdrawn.

Claim 7 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lev et al in view of Zare et al. Applicants respectfully traverse this rejection because the claim rejected is a dependant claim, which depends from amended independent claim 1 and thus contains all of that claim's limitations. Claim 1 includes the structural limitations that the substrate cover the entire perimeter of the support structure and that the apparatus be constructed for solid phase microextraction. Such structural limitations are not suggested in the above-cited references. Applicants respectfully submit that the rejections under 35 U.S.C. §103(a) should be withdrawn.

Claim 8 was rejected under 35 U.S.C. §103(a) as being unpatentable over Lev et al and Zare et al as applied above, and further in view of Miles et al. Applicants respectfully traverse this rejection because the claim rejected is a dependant claim, which depends independent claim 1 and thus contains all of that claim's limitations. Claim 1 includes the structural limitations that the substrate cover the entire perimeter of the support structure and that the apparatus be constructed for solid phase microextraction. Such structural limitations are not suggested in the above-cited references. Applicants respectfully submit that the rejections under 35 U.S.C. §103(a) should be withdrawn.

Conclusion

Reconsideration and allowance of claims 1 and 3-12 and allowance of new claims 21-23 is respectfully requested. The Applicants respectfully submit that no new matter has been introduced by these amendments to the specification and to the claims.

In the event that the Examiner finds any remaining impediment to the prompt allowance of these claims that could be clarified with a telephone conference, he is respectfully requested to initiate the same with the undersigned at (925) 422-6458.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

1. (Amended) An apparatus, comprising:

a support structure formed of a material selected from the group consisting of glass fibers, plastic fibers, [stainless steel wire, and kovar wire] and metal wire; and

a sample collection substrate constructed for solid phase microextraction on the support structure, wherein the substrate covers the entire perimeter of one end of the support structure and the substrate comprises a material selected from the group consisting of organic aerogels, inorganic aerogels, organic xerogels, inorganic xerogels, and combinations thereof.